

*Platt & Mansel*

**ROOFS  
AND  
THEIR  
COVERING**

**D. ANDERSON & SON LTD.**

MANCHESTER • LONDON • BELFAST • BIRMINGHAM • GLASGOW



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# ROOFS AND THEIR COVERING

Representative :-

**A. H. HAIGH,**  
"HEADFIELD,"  
33, BUTTERMERE ROAD,  
BOLTON, BRADFORD.  
Tel. Bradford 2876

## **D. ANDERSON & SON LTD.**

PARK ROAD WORKS  
STRET福德  
MANCHESTER

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LAGAN WORKS  
BELFAST

ROACH ROAD WORKS  
OLD FORD  
LONDON, E.3

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3 NEW STREET  
BIRMINGHAM

And at GLASGOW



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# FOREWORD

OVER 80 years ago David Anderson commenced the manufacture of Roofing Felts and laid the foundation of the firm of D. Anderson & Son Ltd. Almost from its inception the firm engaged in the construction of roofs of all kinds where felt was to be used as the final waterproof covering. They were among the first in this country to carry out contracts for flat-roof covering of the built-up type, and also studied and developed the Belfast Lattice Girder roof.

During the whole of their career as roof builders they have constantly been on the lookout for improved methods of construction and finish and have not hesitated at any time to adopt all ideas that promised better results.

Originally built-up flat roofs were given a protecting covering of sand and gravel about three inches thick. The object of this covering was two-fold: firstly to protect the surface of the felt where the roof was being subjected to traffic; secondly to render the roof absolutely proof against fire from external causes.

The sand and gravel finish has now been almost completely superseded by a Macadam covering, and D. Anderson & Son Ltd. have developed their system under the name of "MACASFELT."

Another system of flat-roof covering is "DUROK," in which a different kind of felt is used and the Macadam covering omitted.

All these systems of roof structures and coverings are described in the following pages, and the numerous sketches show the ideal methods of construction and finish which may be varied to suit individual cases.

*D. Anderson & Son Ltd.*



## "MACASFELT"

**F**LAT roofs are coming more and more into vogue in this country. They must fulfil two conditions—they must permanently resist the most severe weather conditions and they must be fire-resisting. "MACASFELT" is eminently satisfactory on both these points. Another very desirable feature is a high insulation value, and this also "MACASFELT" possesses.

"MACASFELT" is a system of covering which consists of layers of plastic bitumen asphalt alternated with layers of Flexible Waterproof Sheeting, the whole being covered with a layer of fine asphaltic Macadam about  $\frac{1}{2}$ " thick, which gives an asphalt-like surface.

The sketches shown on the following pages illustrate the methods of laying, finishing at walls, verges, etc., and are self-explanatory.

"MACASFELT" holds a great advantage over most other flat-roof coverings in that it is flexible and not likely to become brittle with the consequent tendency towards cracking inherent in so many coverings.

The three layers of Waterproof Sheeting combined with the interlining of Bitumen make the roof permanently waterproof, while the Macadam finishing layer gives a hard-wearing, fireproof surface not

likely to be damaged by any ordinary usage. The Macadam also protects the sheeting from the rays of the sun.

When the Macadam is laid it is rolled to a smooth even surface which improves with age.

"MACASFELT" is suitable for covering flat roofs under any conditions—Garden roofs, sleeping verandahs on private houses, open-air recreation rooms, or storage space on business premises.

"MACASFELT" compares favourably in price with other types of flat-roof covering. Area and distance from Works naturally affect the cost, but generally speaking it is no more expensive than other forms and has the advantage of being guaranteed permanent.

"MACASFELT" can be adopted for re-covering flat roofs originally covered with other materials which have become defective.

"MACASFELT" consisting of three layers of sheeting, three layers of bitumen and  $\frac{1}{2}$ " Macadam has a total thickness of approximately 1" and weighs approximately  $\frac{1}{2}$  cwt. per square yard.

We are ready to give advice on any flat roof problem free of charge.

The following sketches illustrate most of the difficulties to be met with



in flat-roof work. They show what we have found to be the ideal methods of finishing, but each individual problem is considered on its merits and modifications introduced where necessary. The sketches refer only to the roof covering and not to any other part of the roof construction.

Particular attention is drawn to the necessity for angle fillets at walls, the use of metal flashings, the method of finishing at open eaves and verges, the finish into outlets through walls and round rain pipes or stove pipes through roof and round posts or balustrades rising from the roof surface.

The sketches show "MACASFELT" laid on both concrete and wood surfaces. It will be noted that we recommend the use of a layer of Bitumen Dampcourse immediately

above the counter flashing in parapets to prevent damp striking down from the top of the wall.

Where possible we prefer to execute all metal flashings to ensure them being carried out to our requirements. In the construction of the roof a fall of at least one in sixty is recommended for surface drainage.

Ordinarily a "Macasfelt" finish is not suitable for sloping surfaces, but where the slope does not exceed 30° we can adapt a special finish to make a satisfactory job provided it is not desired to complete the work to an open eaves.

On vertical work such as a deep step between roofs where the Macadam finish is impracticable we use a special ready gritted roofing for the final layer.

*From experience we have found breeze concrete emits gases which are liable to damage any form of water-proof flat roof covering. We are at all times willing to advise on the question of suitable finishes.*



# MACASFELT FLAT ROOFING

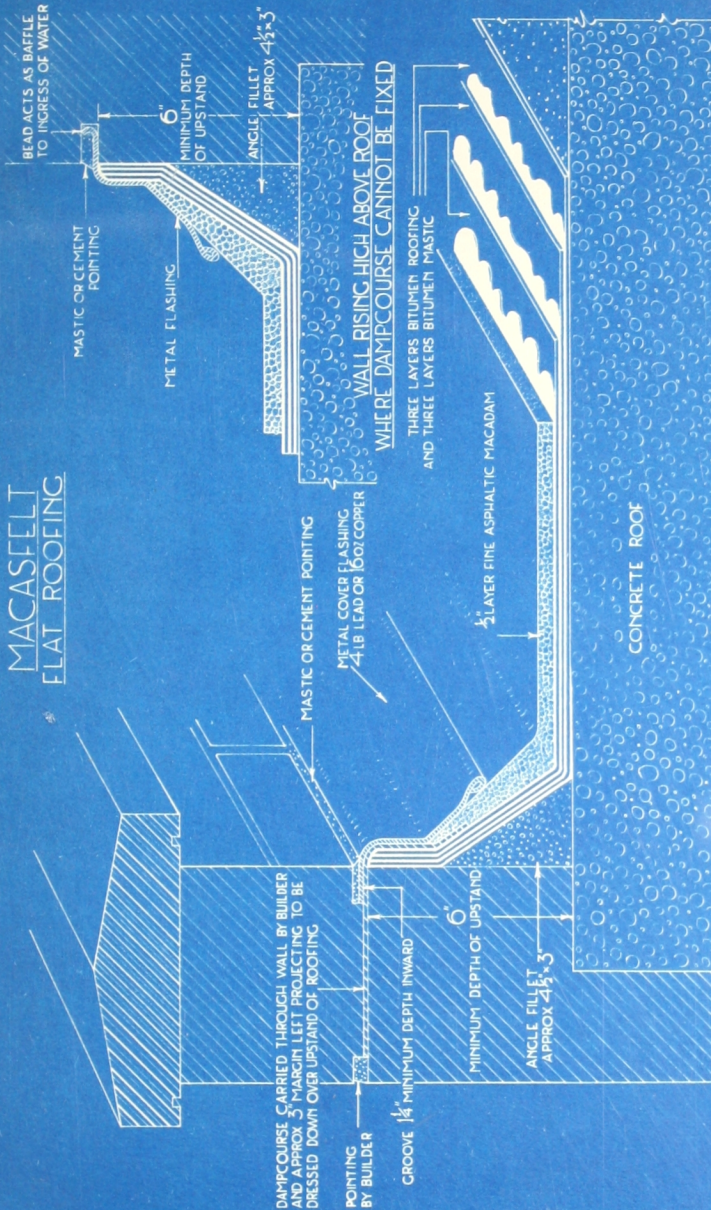


MACASFELT  
FLAT ROOFING

BEAD ACTS AS BAFFLE  
TO INGRESS OF WATER



# MACASFELT FLAT ROOFING

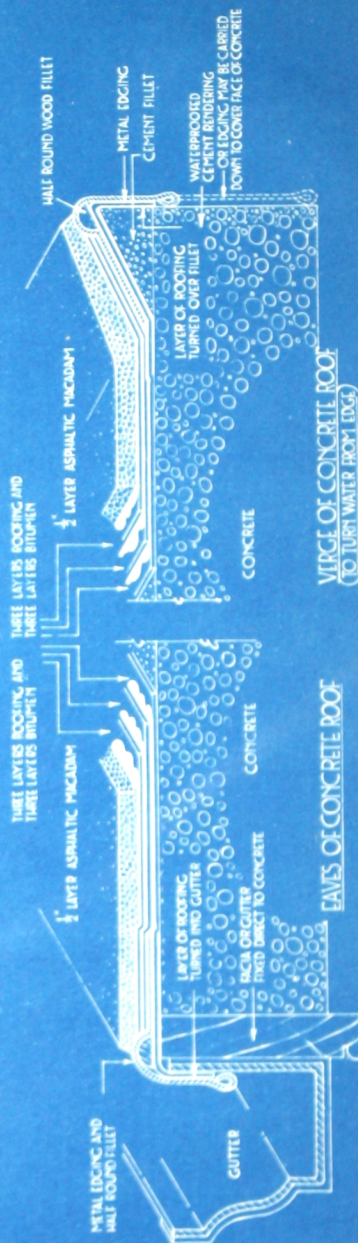


SECTION THROUGH CONCRETE ROOF AT PARAPET WALL  
SHOWING FINISH OF MACASFELT WITH METAL FLASHING AND INCLUDING A DAMPCOURSE TO WALL

CONCRETE TO BE LEFT BY BUILDER WITH A FIRM AND REASONABLY SMOOTH SURFACE TO RECEIVE OUR WORK  
CONCRETE TO BE LAID TO FALL BY BUILDER  
A FALL OF 1 IN 100 IS RECOMMENDED TO ENSURE DRAINAGE OF SURFACE WATER



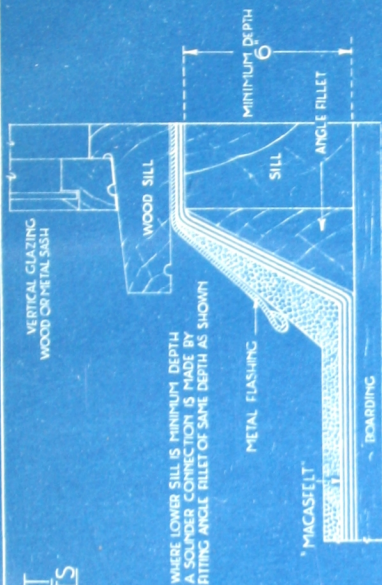
# MACASELT DETAIL AT EAVES AND VERGES



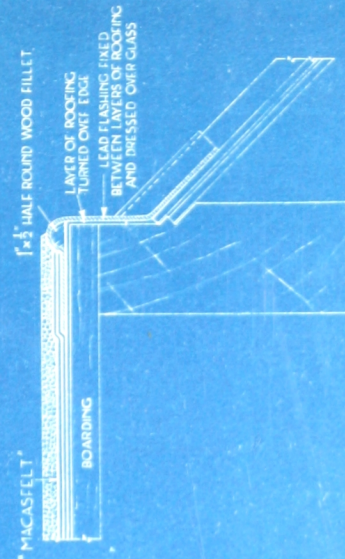
AT ALL EAVES OR VERGES, WE RECOMMEND A METAL UNDERGLASSING (OR EDGING) IN LEAD OR COPPER, CARRIED OVER A SMALL SEMI-CIRCULAR HARDWOOD FILLET (TO TURN WATER FROM EDGE). THIS CONSTRUCTION FORMS A NEAT STOP FOR THE MACADAM AND A PROTECTION TO THE EDGE.



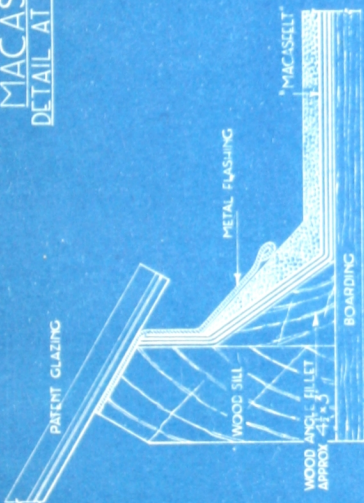
# MACASELT DETAIL AT LIGHTS



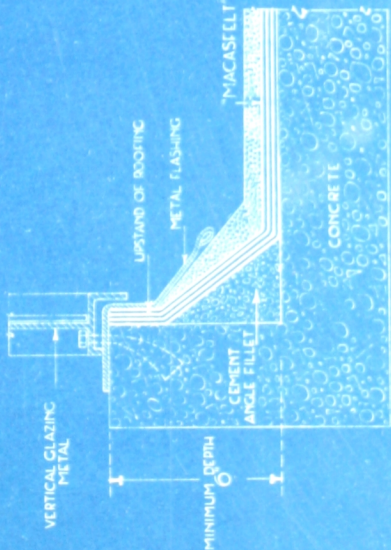
## SILL OF VERTICAL GLAZING (WOOD OR METAL)



## JUNCTION OF FLAT AND GLAZED SLOPE



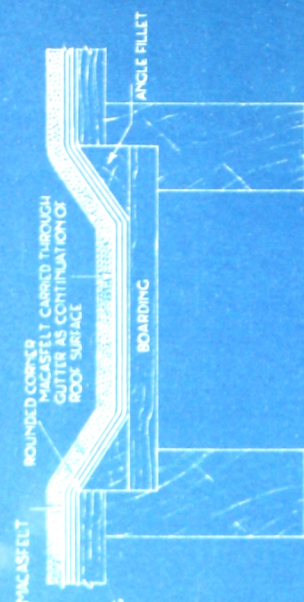
## SILL OF ROOFLIGHT



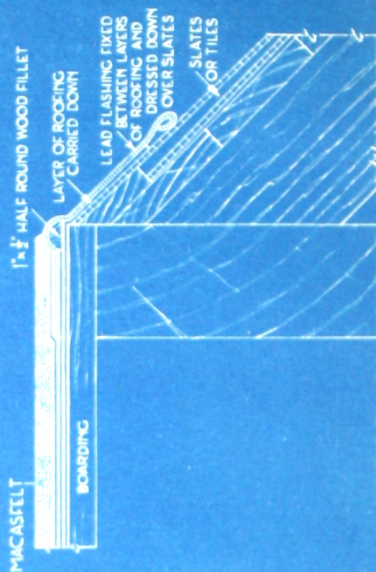
## SILL OF VERTICAL GLAZING (METAL)



# MACASELT DETAIL AT SLATED ROOF AND SUNK GUTTER



## JUNCTION OF FLAT AND FOOT OF SLATED ROOF

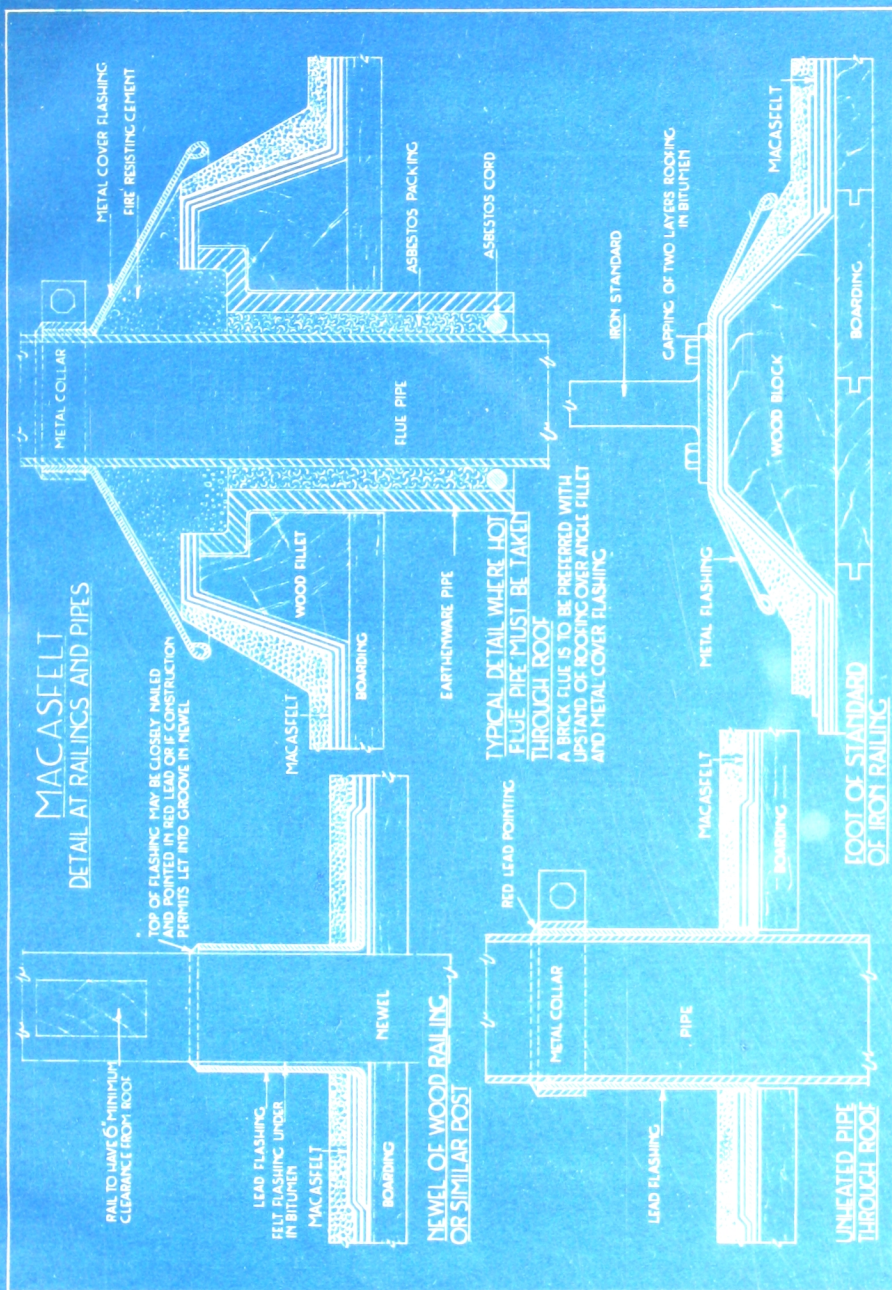


## JUNCTION OF FLAT AND TOP OF SLATED ROOF

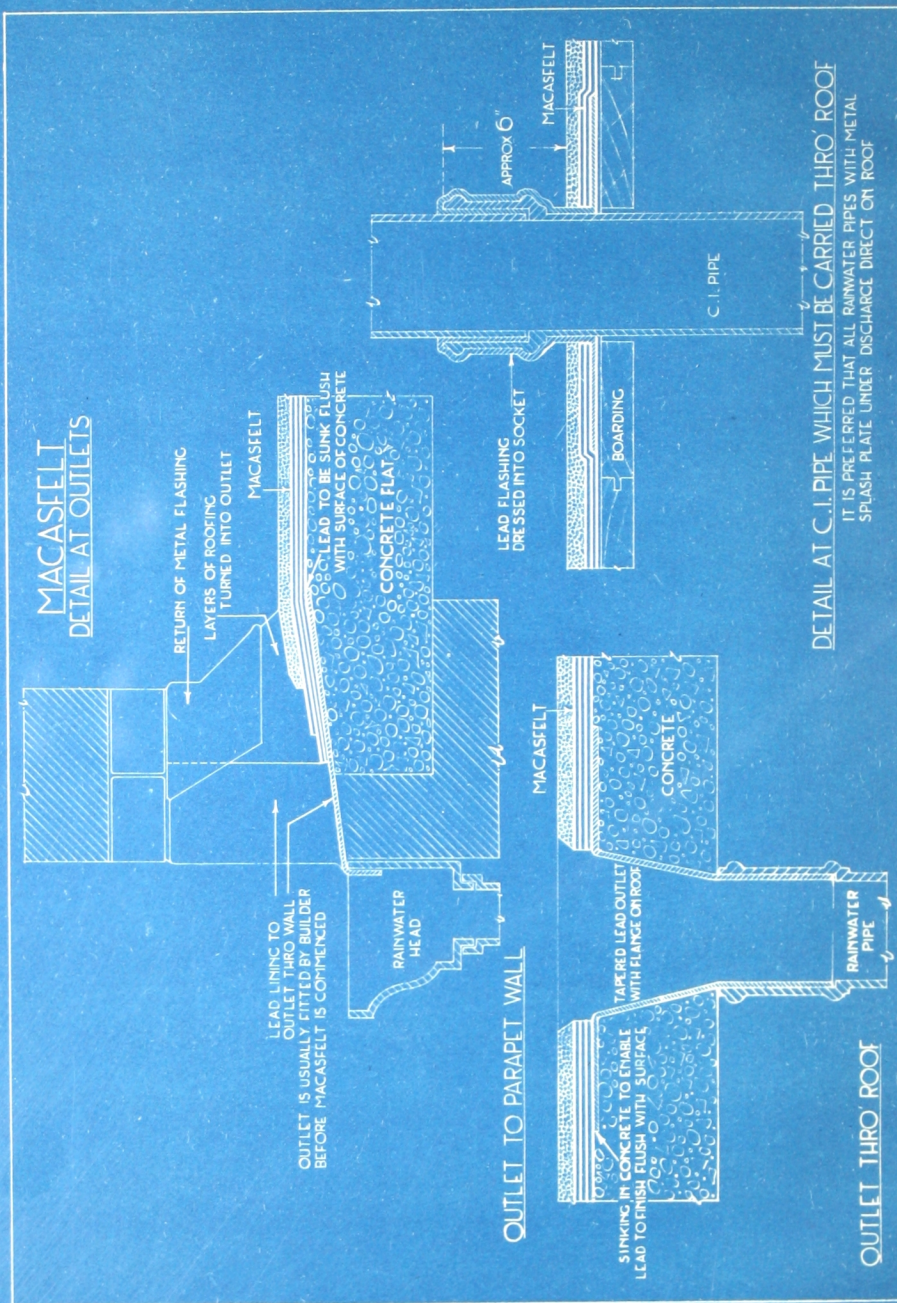


## STEP FROM ROOF





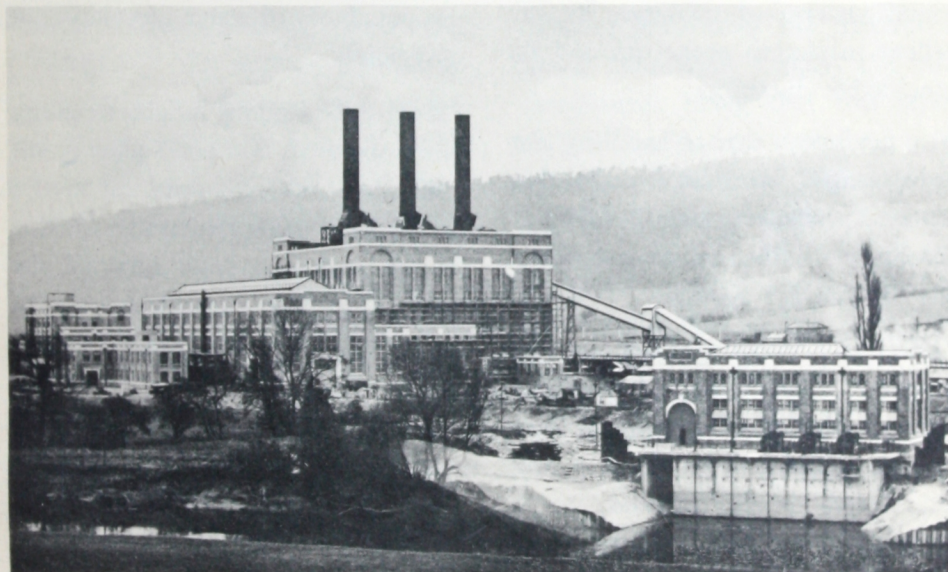








*Southbourne Cliffs Hotel, Bournemouth*



*The New Power Station, Ironbridge, Salop*

TYPICAL BUILDINGS COVERED WITH ANDERSONS "MACASFELT"



## "DUROK"

WHERE the cost will not allow for "Macasfelt" to be used a less expensive covering is provided by our "Durok."

"DUROK" is the registered name for a system of Flat-Roof covering, which in a few words consists of two layers of "Rok" roofing sealed together with Hard Rok Mastic. It provides a very serviceable roof covering.

On every type of roof and in every climate "Rok" has been tried and tested for many years, and everywhere has gained a reputation for its sound waterproof qualities, its excellent insulating properties and its remarkable durability.

The flexibility, ease of handling and light weight of "Rok" make this material particularly suitable for Flat-Roofing work when constructed under the "DUROK" system.

"DUROK" Roofs will not dry out or crack. They become harder and more durable as time elapses. They do not deteriorate as do lead and zinc roofs when exposed to a chemically saturated atmosphere or when situated near the sea coast.

"DUROK" Roofing on boarding gives insulating qualities unexcelled

by any other roofing, maintaining an equable temperature in the building summer and winter.

The principle of construction is as follows:—

An under layer of "Rok" is nailed closely to the boarding, particular attention being given to the overlaps. A coating of hard "Rok" mastic is then applied in a molten state, and the second layer of "Rok" is rolled on while the mastic is hot, cementing it to the bottom layer and making a homogeneous impervious covering—all joints being tightly sealed with no possibility of water percolating at any point.

"DUROK" Roofing is light, weighing only about 10 lbs. per square yard, and consequently it does not need a heavy supporting structure. All that is required is a plain boarded flat surface, without steps, but with the usual fall sufficient to drain off surface water. The "Rok" can be turned up or down at such places as walls, lights or verges to finish off, but arrises should be rounded off and at upstands a triangular wood fillet should be planted.

"Rok" being flexible, can be used for flashing if necessary, but where



possible we recommend metal flashing on account of its greater adaptability in shaping.

For gutter work this system can be used most effectively. Gutters of any shape can be successfully lined, provided that the previously mentioned precautions are taken to avoid acute angles. Outlets are made up in lead to which the "Rok" is made good.

"DUROK" Roofing can be applied equally successfully to roofs of any shape and over existing roof coverings. It is also an excellent method of waterproofing concrete roofs.

Before covering concrete roofs with "DUROK" the surface should be floated to a smooth finish and rounded off at upstands and verges to avoid sharp angles. The surface is then coated with a bituminous concrete

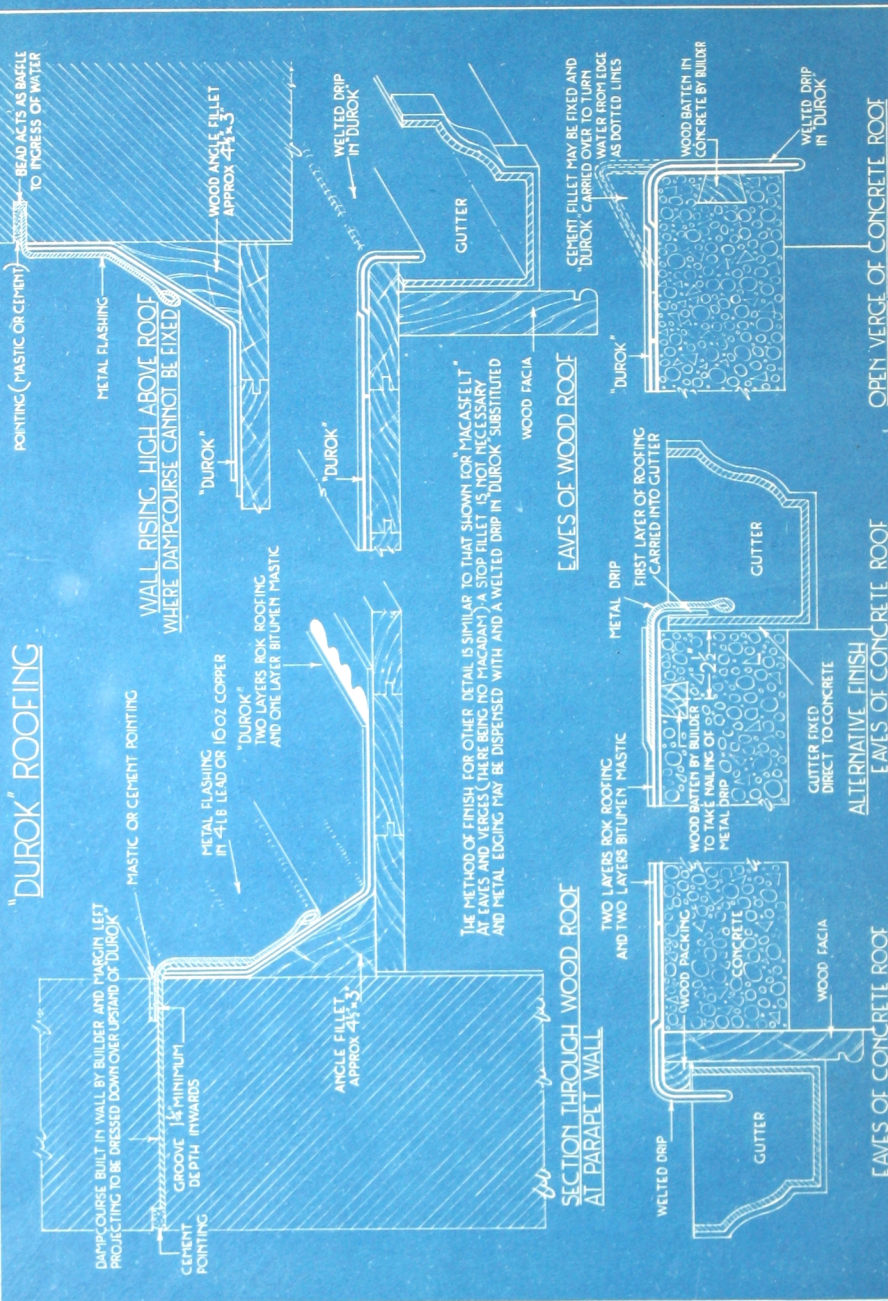
filling compound. To this surface the first layer of "Rok" is cemented with Hard "Rok" Mastic. The second layer is stuck to the first in exactly the same manner as when covering boarded flats.

Provided reasonable care is taken a "DUROK" roof should last indefinitely. An occasional dressing of mastic should be given, say once every five years, but if the roof is to be used for traffic it should be given a protective covering of grit or other suitable material.

The following sketches show method of finishing at walls, open verges, and gutters. In general, however, the sketches illustrating the method of laying "Macasfelt" apply, the only modification being that two layers of "Rok" are used instead of three layers of Waterproof Sheeting and the Macadam is omitted.

*From experience we have found breeze concrete emits gases which are liable to damage any form of waterproof flat roof covering. We are at all times willing to advise on the question of suitable finishes.*









*Spalding Grammar School*



*Embroidery Mill at Messrs. Clark & Co. Ltd., Anchor Mill, Paisley*

TYPICAL BUILDINGS COVERED WITH ANDERSONS "DUROK"



# "BELFAST" LATTICE GIRDER ROOFS

**BEST FOR FARM BUILDINGS, MOTOR GARAGES,  
ENGINEERING WORKS, AEROPLANE HANGARS, etc.**

**T**HE Curved Lattice Girder or "Belfast" roof, needs no introduction, having been in use for over half a century. Its advantages for the purpose of roofing wide spans, without intermediate supports, are well known.

Not so well known are the principles underlaying this form of construction and their application in such a manner as to obtain maximum efficiency. Many are the cases where these roofs have been constructed by the inexperienced, with failure attending the results, especially in the case of wide spans.

We have been the specialists in this form of roof since its origin, having carried on the business for over fifty years in the City from which it takes its name and the description "The Anderson Belfast Roof" is an accepted definition of this roof throughout the Kingdom.

During the European War we placed our services unreservedly at the disposal of the War Office and Admiralty, and furnished all particulars in our power to enable these roofs to be used for the multiple purposes of Aero Sheds, Munition Works, Motor Works, etc., which were required in all parts of the country. The many hundreds of these buildings to be

seen throughout the country (now happily transformed to peace-time purposes) bear witness to the service rendered by the "Belfast" Roof.

At the same time, this led to the practice of widespread building of these roofs by those having little or no experience with them. Results were unfortunate in many cases, reflecting blame on the system which is undeserved. Even at the present day many cheap forms of construction are erected under the description "Belfast" Roofs, which are very far from complying with the correct principles.

Every "Anderson" Roof carries with it the guarantee of being "right" in every particular. We are the pioneers of the system, and our reputation has been built up on efficiency. We are at all times ready to design and estimate for these roofs, to suit our clients' requirements, and we finish them off complete with our guaranteed waterproof roof coverings.

## A BRIEF OUTLINE OF THE CONSTRUCTION

The roof consists essentially of two portions:

- (1) The structural parts (Trusses, Purlins, etc.)
- (2) The covering and waterproofing.



The structural parts ordinarily comprise the Trusses, spaced 9 ft. to 13 ft. apart (according to span and design of building), and the Purlins which support the covering material.

The general design of the Trusses is fairly well known, the strength being obtained by an arrangement combining "truss" stresses and "beam" stresses in a manner that gives a neat, compact truss, with a high factor of safety for all ordinary conditions. The exact details of the construction, and the scantlings to be used for the various spans are studied in each individual case and the results of past experience and research applied. Each truss is guaranteed to be of sufficient strength for the duties it has to perform.

In addition to carrying the roof itself, we can design the trusses to carry light shafting or other loads when required.

The usual covering adopted is one of our special roofing felts manufactured for the purpose, supported by T. & G. boarding laid on the purlins. Should a corrugated self-supporting roofing be preferred, we can supply our "Ferro-Rok" corrugated sheets, fixed in the same manner as ordinary corrugated iron.

Our specialities for roof covering are dealt with fully in separate literature. It will suffice here to mention that their use, especially when fixed by our expert workers, enables us to guarantee perfect waterproofing.

When the complete construction is carried out by us we guarantee a roof that will withstand the most severe weather conditions.

The impression that these roofs can only be regarded as "temporary" is a fallacy. With the modern materials we use for the covering, and given a reasonable amount of attention and upkeep, their life need only be determined by that of the timber itself. Roofs erected by us at our Belfast Works over 50 years ago are still in good serviceable condition.

"Belfast" Roofs are flexible in design and can be adapted to any irregular shape of building.

If desired, the timber in the trusses, purlins and struts can be planed for varnishing or painting. Thus the roof lends itself easily to interior decoration, with a ceiling formed on the underside of the purlins; alternatively a ceiling can be constructed at tie-beam level.

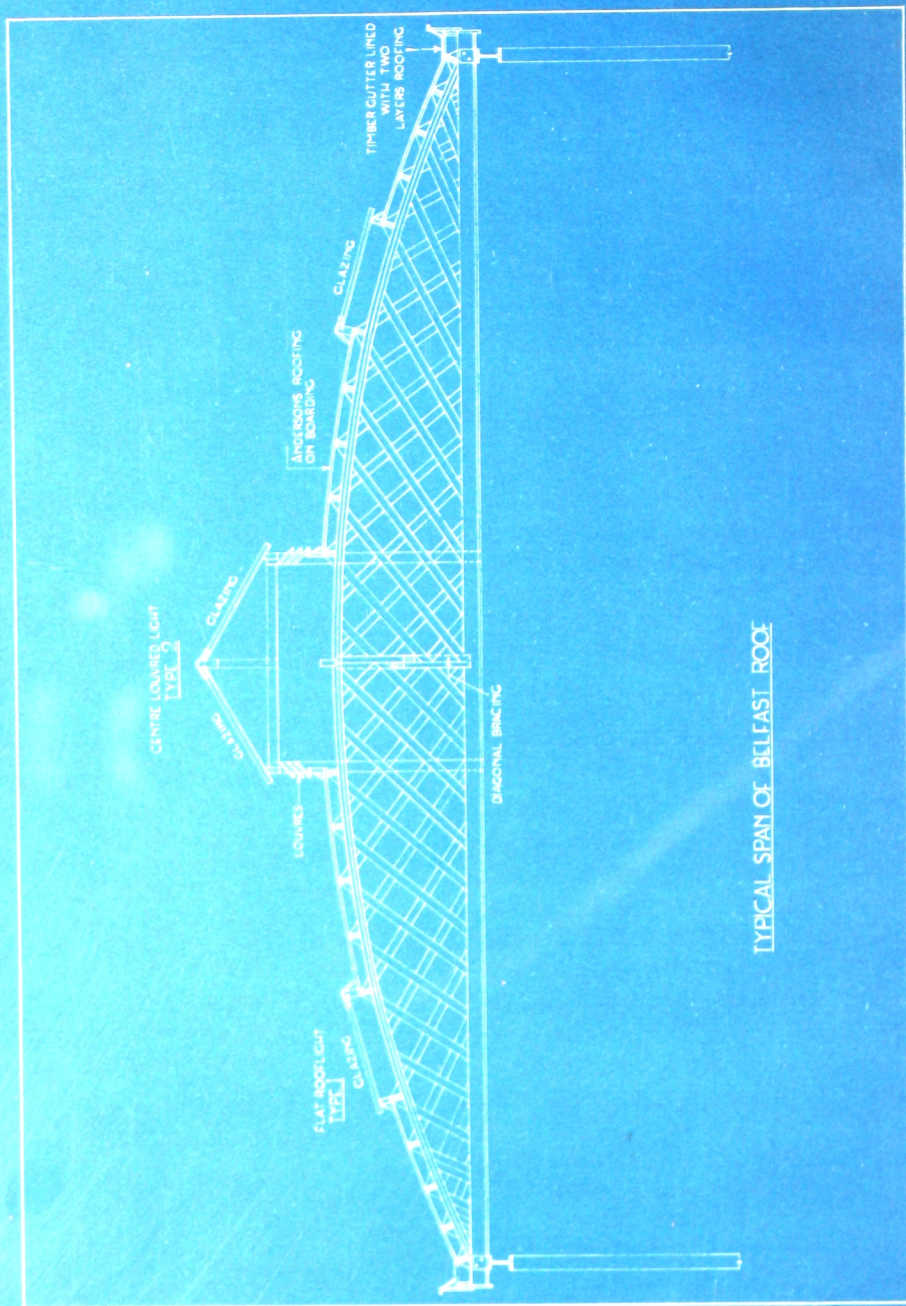
Lights and ventilation to meet any requirement can be included in the design.

The lattice girder construction can be adapted to roofs of other than segmental shape, although it is in the segmental "Belfast" Roof that greatest advantage is gained.

The "Belfast" truss can be made to give a clear span up to 120 ft.

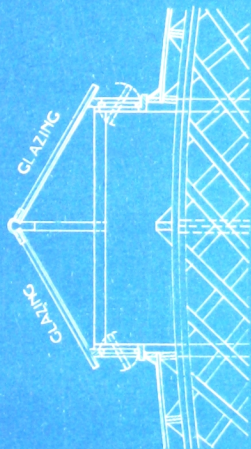
The following sketches show the lattice girder construction and also details of gutters, roof lights, and methods of securing girders to walls.



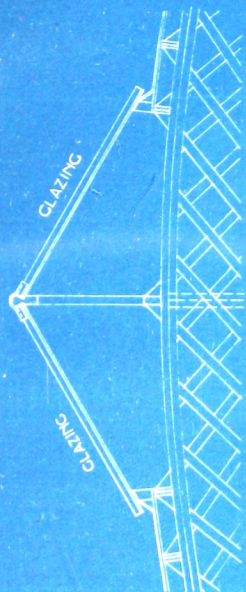


TYPICAL SPAN OF BELFAST ROOF

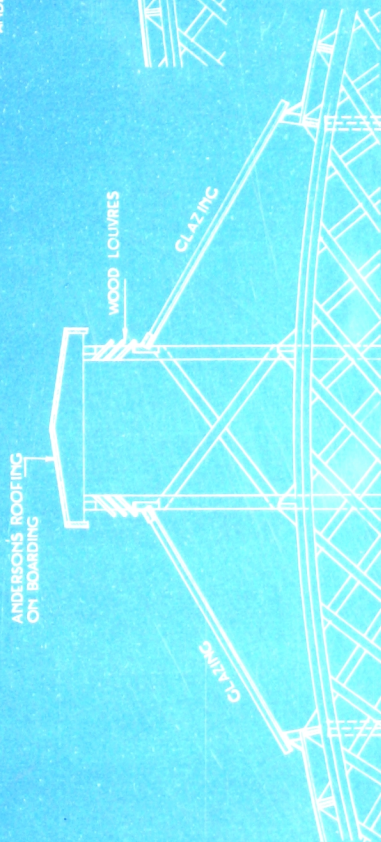




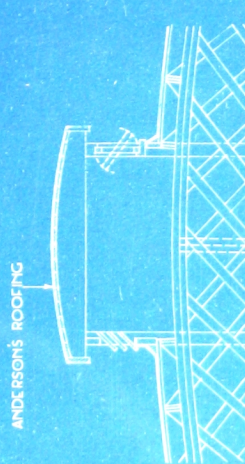
TYPE 3  
CENTRE LIGHT WITH OPENING PANELS



TYPE 4  
PLAIN CENTRE LIGHT

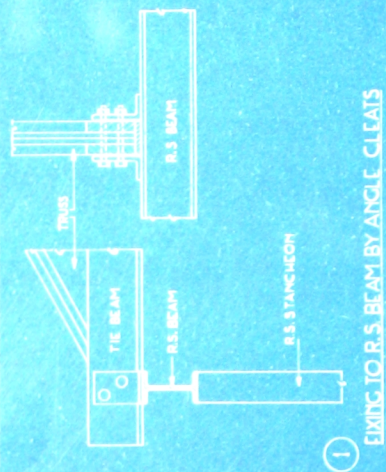


TYPE 5  
CENTRE ROOFLIGHT AND VENTILATOR

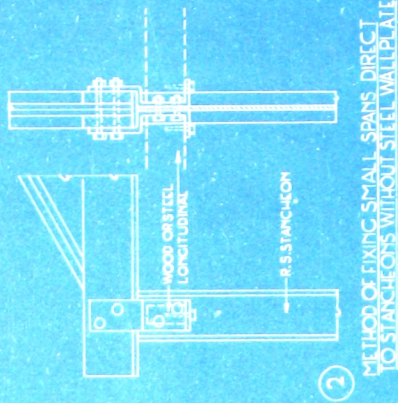


TYPE 6  
VENTILATOR SHOWING  
ALTERNATIVE OF LOUVRES  
OR OPENING PANELS

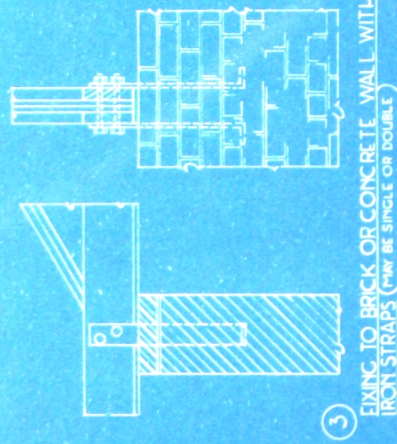




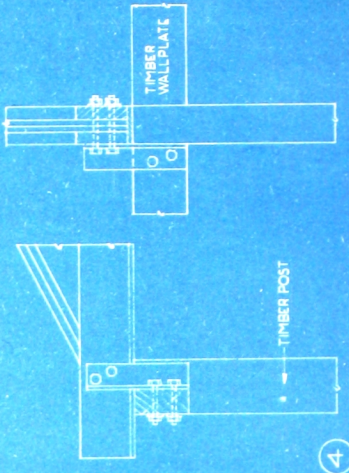
FIXING TO R.S. BEAM BY ANGLE CLEATS



METHOD OF FIXING SMALL SPANS DIRECT TO STANCHIONS WITHOUT STEEL WALLPLATE



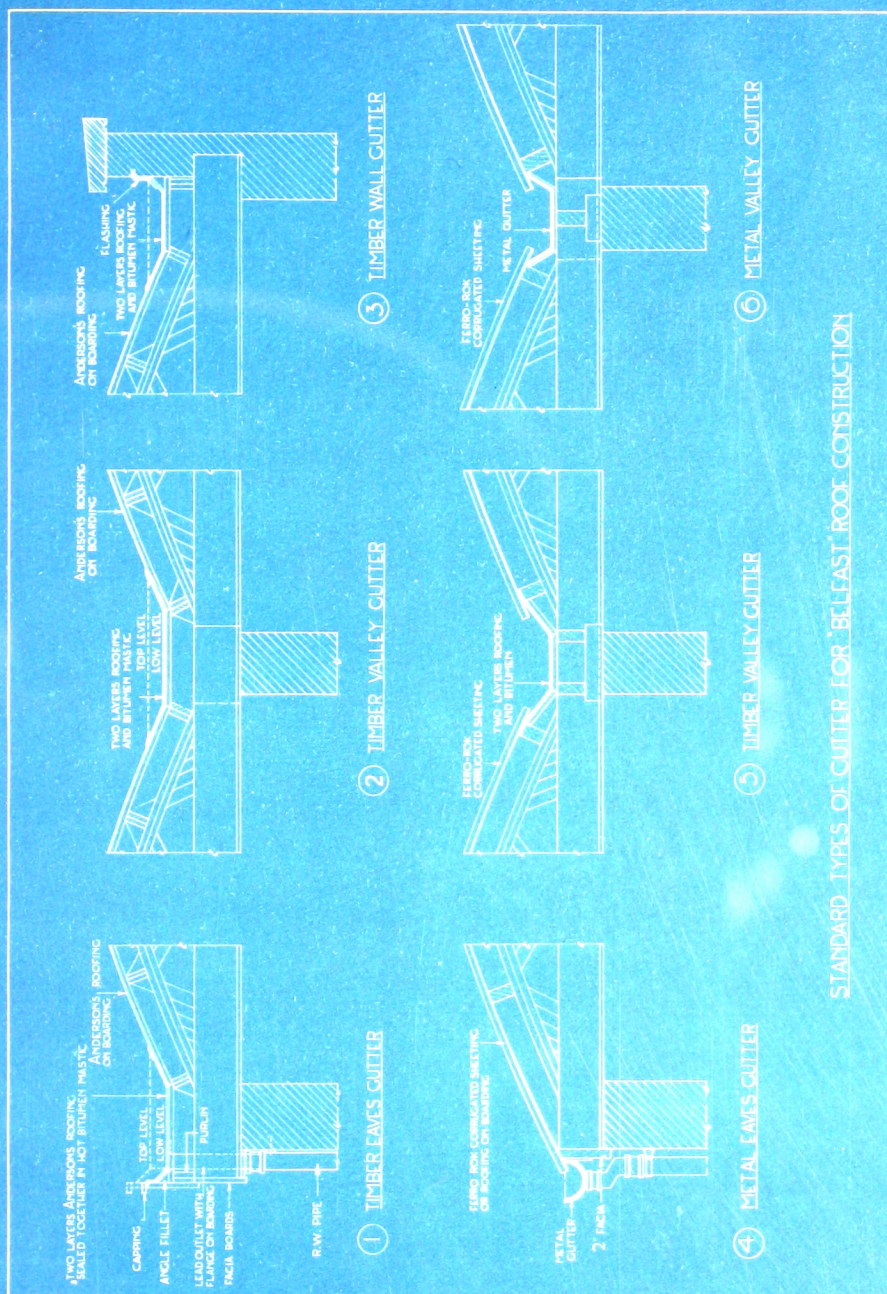
FIXING TO BRICK OR CONCRETE WALL WITH IRON STRAPS (MAY BE SINGLE OR DOUBLE)



TYPICAL METHOD OF FIXING TO POSTS AND WOOD WALLPLATE

METHOD OF SECURING TRUSSES TO SUPPORTS  
SIDE VIEW AND SECTION IS SHOWN IN EACH CASE





STANDARD TYPES OF GUTTER FOR BELFAST ROOF CONSTRUCTION



## "ROK" ROOFING ON "BELFAST" OR ORDINARY PITCHED ROOFS

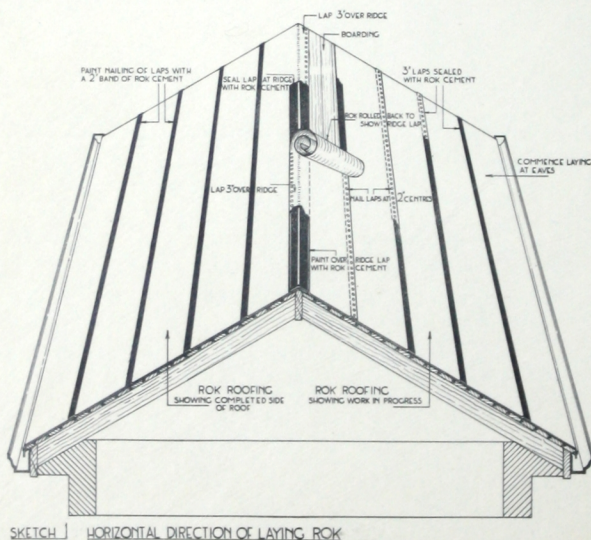
**T**O be absolutely weatherproof a felt roof must be properly laid. Any tradesman can make a perfectly satisfactory job provided the instructions given on the following pages are carefully observed.

In addition to building Belfast Roofs and covering flat roofs we specialize in covering roofs of all kinds whether curved or pitched, and usually it will be found that for moderate or large areas the work can be carried out more economically by our skilled men. This is especially the case where there is much two-layer work to be done in gutters. We are always prepared to quote prices for such work.

### DIRECTIONS FOR LAYING "ROK" ROOFING ON BELFAST ROOFS, OR ON ORDINARY PITCHED ROOFS

Unroll the "Rok" Roofing and expose it to the weather for a few days before fixing. This will allow it to expand and remove any tendency to wrinkle. Roof Boards should be of seasoned timber, uniform in thickness and laid close together. T. & G. boards are preferable.

Sweep roof clean, cover knot holes with a small piece of Roofing or tin. If applied

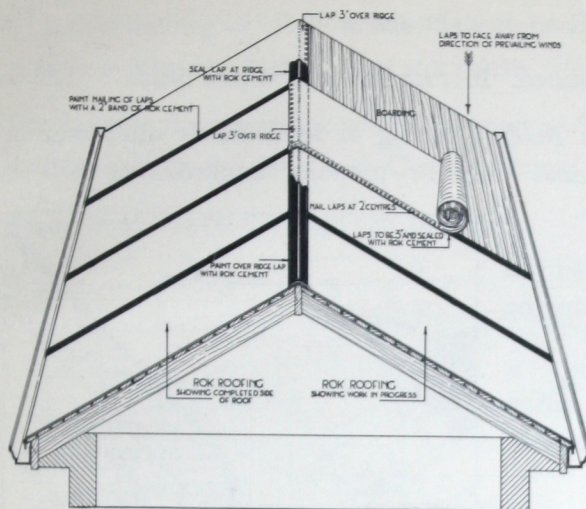


SKETCH 1 HORIZONTAL DIRECTION OF LAYING ROK

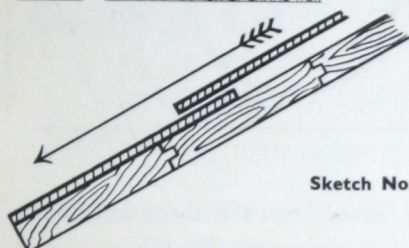
over an old roof, see that all boards are sound and all nails driven in so as not to puncture Roofing.

"Rok" may be laid either horizontally (gable to gable) see Sketch 1, or vertically (ridge to eave) see Sketch 2. The gable to gable method is simpler and more easily made weatherproof by inexperienced hands, the joints being made so that they do not obstruct the





SKETCH 2 VERTICAL DIRECTION OF LAYING ROK



Sketch No. 3

layer when turned over the ridge will present a smooth unbroken surface to the driving rain, see Sketch 1. In the ridge to eave method commence at the end of the building away from the direction of the wind. This ensures that driving rain will blow over the joints and not into them, see Sketch 2.

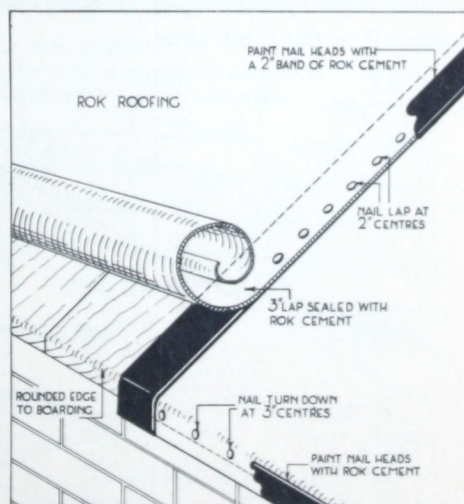
Remove the powder from the edge with a cloth, and coat well with "Rok" cement between the laps, see Sketch 4.

Coat the nail heads and seams with a band of Cement 2" wide, using a

free flow of water over the roof, see Sketch 3. In the gable to gable method commence at the eaves and work upwards to the ridge. Each length should overlap the adjoining length 3".

If laying the "Rok" from ridge to eave, commence nailing from the top and work downwards; if from gable to gable commence at one end, not in the middle, and in both cases keep the felt well stretched from the opposite end. Space the nails 2" apart and  $\frac{3}{4}$ " from the edge.

When closing in at the ridge finish the side away from the prevailing wind first, then the last



SKETCH 4 METHOD OF MAKING LAP AND DRESSING TO EAVES



chalk line to make edges of band straight and neat.

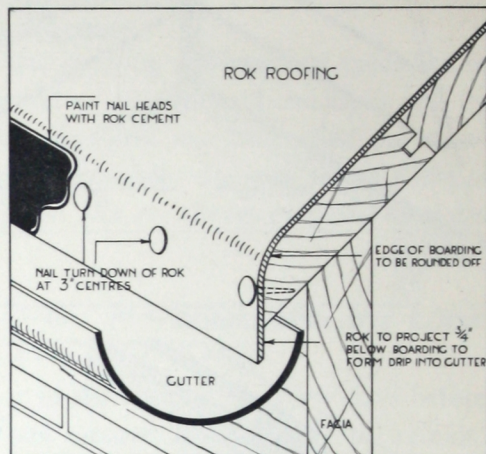
"Rok" cement should not be heated. It is applied cold with a brush.

It is not advisable to lay the Roofing during or immediately after rain or snow, as "Rok" cement cannot then be properly applied, nor will it adhere firmly to a wet surface.

Joints in roof should be marked on the "Rok" with chalk to avoid driving nails between the boards.

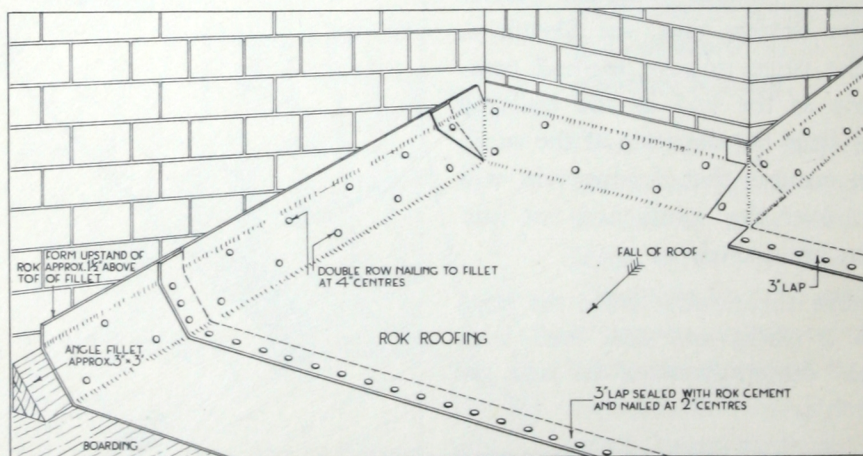
No roof can be weatherproof unless all joints are carefully lapped, nailed, and sealed.

All edges of boarding at eaves or elsewhere should be rounded to avoid any risk of cutting the "Rok," see Sketch 5. This sketch also shows the method of finishing into gutter.



SKETCH 5 FINISH AT CUTTER

Flashings or brick parapets, walls, or chimneys, should be carried out as follows: Fix an angle fillet of wood, as shown in Sketch 6, carry the "Rok" up over it, nailing it at the same time.



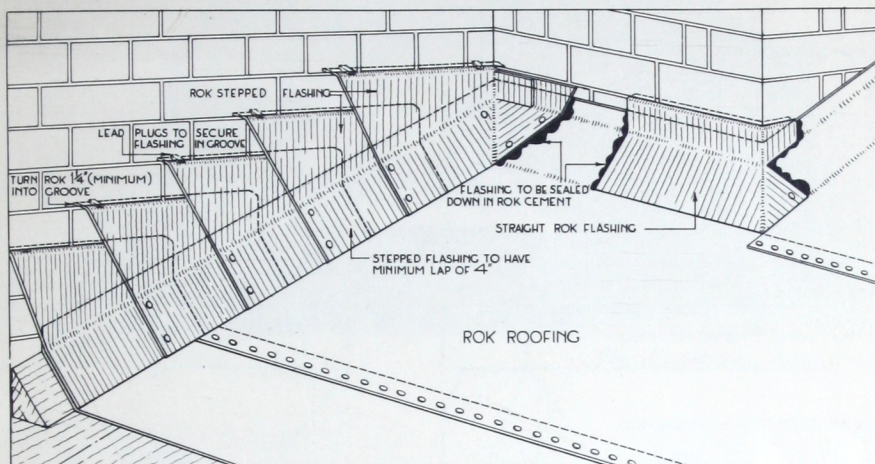
SKETCH 6 METHOD OF LAYING ROK AND DRESSING TO WALLS AND CORNERS  
(COVER FLASHINGS ARE SHOWN ON SEPARATE SKETCH)



A counter flashing of "Rok" should be let into the brickwork and dressed down so as to overlap the flashing, and stuck with "Rok" Cement.

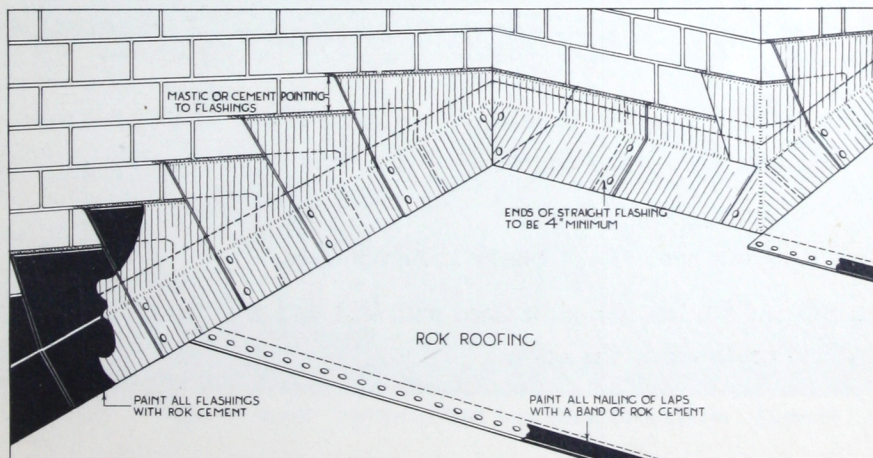
The joint of the brickwork where the counter flashing has been let in should then be wedged and filled with Cement Mortar.

If preferred, metal flashings can be used.



SKETCH 6A METHOD OF FIXING COVER FLASHING

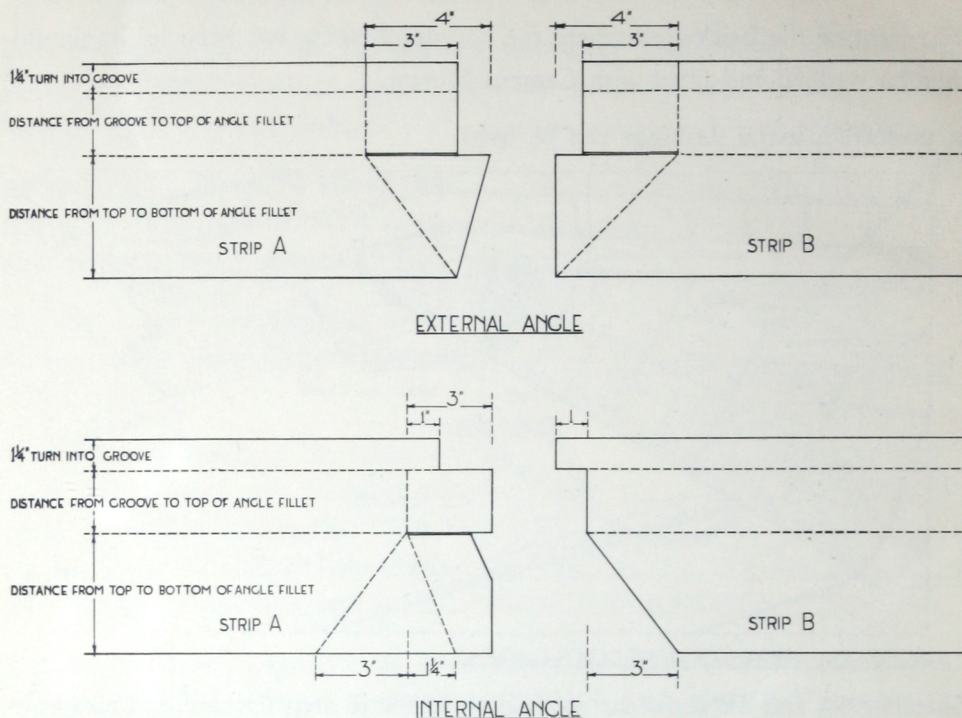
Sketches 6A and 6B show the method to follow in step flashing and also how to fix flashings at both internal and external angles.



SKETCH 6B SHOWING COMPLETION OF WORK



Sketch 7 shows the proper method of cutting the pieces for step flashing at internal and external angles.



### SKETCH 7

#### TYPICAL METHOD OF CUTTING ENDS OF COVER FLASHING TO TURN ROUND ANGLES

CUT TO SHAPE SHOWN - SLIT AT DOUBLE LINES AND FOLD AT DOTTED LINES  
FOR EITHER THE EXTERNAL OR INTERNAL ANGLES - STRIP A IS FIRST FIXED AND THEN STRIP B  
THESE ANGLES ARE CUT FOR A ROOF OF LOW PITCH ABOUT 15° AND USING A 3"×3" ANGLE FILLET BUT BY A SMALL  
ADJUSTMENT THE METHOD CAN BE APPLIED TO ANY OTHER CASE

Gutters and Valleys should be made of two layers of the "Rok" stuck together, only the under layer being nailed. Nails must not be driven through the top layer.

For sticking, our hard "Rok" Mastic should be used.

Cesspools and Outlets should be lined with lead and the "Rok" turned over, nailed and cemented to the sides.





*The Hippodrome, Nottingham*



*Messrs. Morris Commercial Cars Ltd., Soho, Birmingham. Despatch Stores*

TYPICAL BUILDINGS COVERED WITH ANDERSONS "ROK" ROOFING



## "FERRO-ROK"

WITH many years experience of bitumens and their use in the manufacture of roof coverings behind it, "Ferro-Rok" was offered to the public by us a number of years ago with a great deal of optimism. Its reception ever since it first appeared has justified our own enthusiasm.

It has steadily grown in popularity—and rightly so—for it is a light, unbreakable and durable roof covering, proved to withstand the most severe climatic conditions, unaffected by acid and alkali fumes, or salt spray.

It is quickly laid, thus reducing initial cost to a minimum; does not require annual painting thereby almost eliminating upkeep costs, and being largely composed of felt and bitumen, is a good non-conductor, the danger of sweating being practically removed.

"Ferro-Rok" is very extensively used in chemical and steel works. It is being constantly used to replace galvanized sheeting where this material has been found entirely unsatisfactory.

As the name implies, "Ferro-Rok" is a combination of steel and the well-known "Rok" Roofing. It therefore almost needs no introduction.

The core is a specially annealed steel sheet, treated before being immersed in the first coating of bitumen to ensure perfect cohesion of the bitumen and metal. The steel sheet is first immersed in a hot bath of adhesive bitumen, then covered with a sheet of "Rok" Roofing on each side and finally coated with a high quality, high melting point bitumen.

To ensure perfect protection for the steel sheet the upper layer of "Rok" is folded over the edges and sealed on the *underside*. The steel sheet is thus completely enclosed in an envelope of reinforced bitumen, the most perfect anti-corrosive covering obtainable.

Sealing the sheet on the underside ensures that when the sheets are placed in position on the roof there are no edges exposed which can be torn or pulled away to allow moisture or fumes to get at the surface of the metal.



The sheets are covered while flat, and afterwards corrugated to a standard of eight three-inch corrugations.

This has been found the most convenient size and facilitates their use for gradually replacing corroded galvanized sheets in small sections where it has not been convenient or possible to strip and re-cover large areas.

The sheets are supplied in any length required from 5 to 10 feet, and are stocked in standard lengths of even feet. If intermediate lengths are required these are either cut from the next longer sheet, the longer length being charged for or if time permits are made specially, in which case only the actual length supplied is charged.

The actual width of a corrugated sheet of eight 3-inch corrugations is 2 ft. 2 ins. and covers 2 feet nominal with one corrugation side lap, or 1 ft. 9 ins. with two corrugations side lap.

An end lap of 6 ins. is recommended.

Ridging, made on the same principle as sheets, is supplied in 3 ft. or 6 ft. lengths by 18 ins. girth.

"Ferro-Rok" is made in four gauges of metal, viz.: 26, 24, 22, 20.

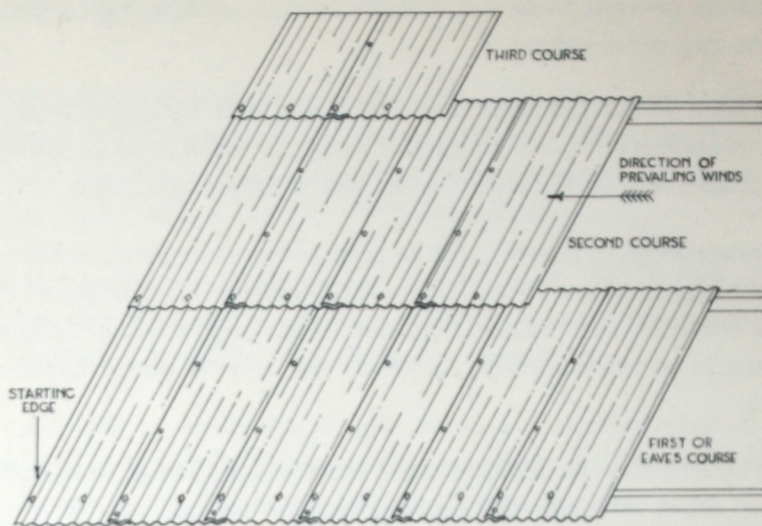
## INSTRUCTIONS FOR LAYING

In general practice the same procedure should be followed in fixing "Ferro-Rok" as in fixing galvanized corrugated sheets.

Always commence laying at that end of the building farthest away from the direction of the prevailing winds. This ensures that all side joints are laid with their backs to the weather, and allows rain to blow over them instead of into them, thus minimising the risk of leakage from driving rain.

Commence at the eaves and work upwards, completing each row before starting the next, or at least take care that the lower row is always carried not less than two sheets ahead of the one next above.



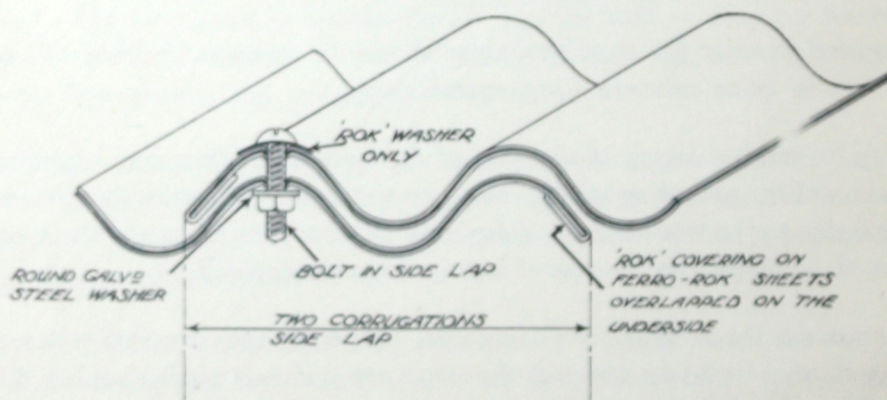


Sketch No. 1

*End Laps* of 6 inches are essential, but if pitch of roof is very flat (less than  $30^\circ$ ) a greater overlap is advisable. In vertical sheeting 3 or 4 inches end lap is sufficient.

*Side Laps.*—Either one or two corrugations may be given, but if the site is very exposed two are essential.

The protective covering on "Ferro-Rok" is overlapped on the underside, so that either edge of the sheet can be exposed to the weather. (See sketch No. 2.)



Sketch No. 2



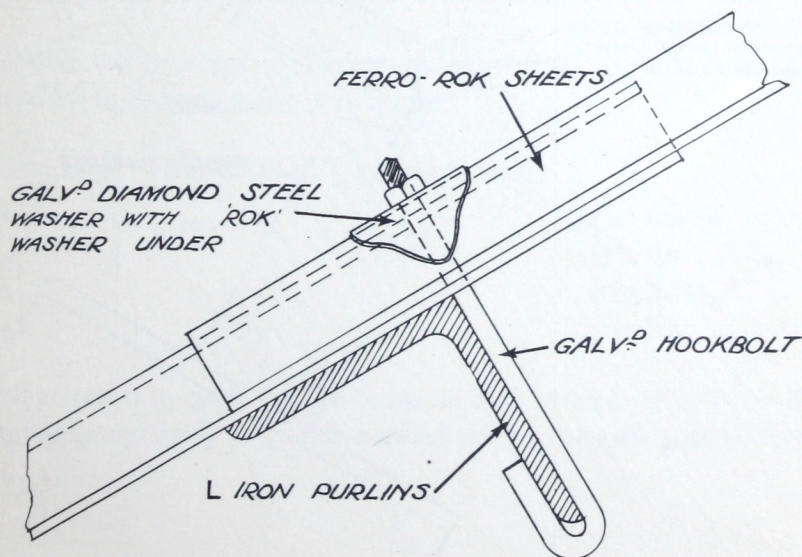
The sheets must be laid with the last corrugation turned towards the inside of the building (see Sketch 2).

On vertical work one corrugation overlap is ordinarily sufficient to give satisfactory weatherproofing if care is taken to see that the lap is laid away from the weather.

The sheets are secured to the purlins or runners by means of standard galvanized fastenings, as used for galvanized sheets—drive screws for wood purlins, or hook bolts for steel purlins.

Drive screws  $2\frac{1}{2}$ " long by  $\frac{1}{4}$ " diameter are sufficient in most cases, but the length of hook bolts is naturally determined by the depth of the flange on angle iron. To determine the length of hook bolts required, allow  $1\frac{1}{2}$ " more than the depth of flange on the angle iron. Under the head of drive screw or under the nut of hook bolt use a galvanized curved diamond steel washer  $1\frac{1}{2}" \times 1\frac{1}{2}"$  (See sketches Nos. 3 and 4).

With each consignment of sheets a supply of felt washers is sent. Place one of these diamond-shaped felt washers under the galvanized diamond washer. This felt washer seals the nail or bolt hole and prevents leakage or corrosion at this point.



Sketch No. 3



Side sheeting bolts are necessary between purlins, and should be placed at not more than 18" centres. Place one of the round felt washers only under the head of the side bolt on the outside, and a round galvanized steel washer between the nut and the sheet on the inside. Side bolts should be 1" or 1½" long by ¼" diameter.

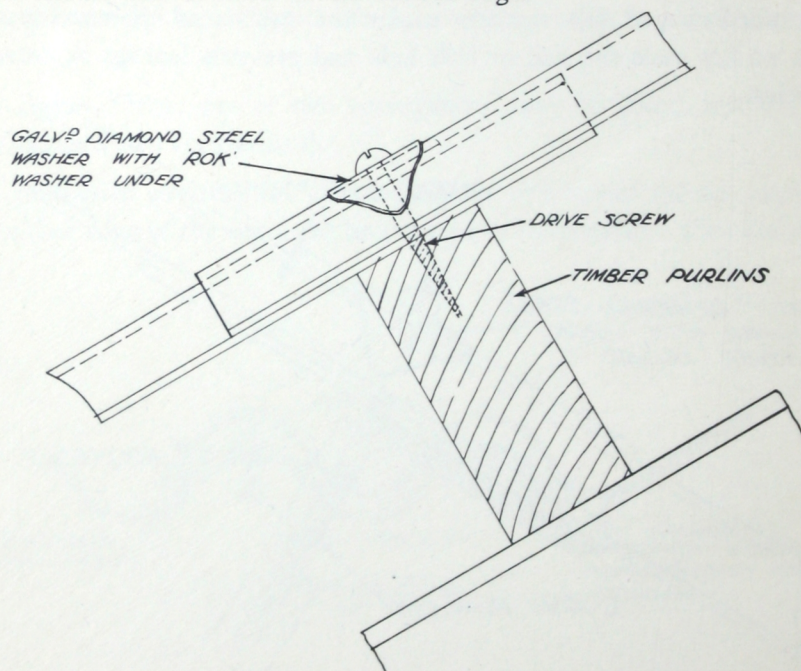
Two drive screws or hook bolts per sheet per purlin are usually sufficient except under very exposed positions or unusual conditions, when the number may with advantage be increased to three, and the number of side bolts may also be increased, spacing at say 12" centres.

The sheets must always be punched on *top* of the corrugations.

Bolts for ridging should be at not more than 12" centres.

With each consignment of sheets is also sent a supply of thick bitumen mastic.

The end of drive screw or hook bolt should be dipped in this Mastic. The driving or screwing will cause the mastic to flush up and seal the ragged edge of the hole left by punching. If sheets are to be cut on the job a little of the mastic should also be used to seal the cut edge.



Sketch No. 4



Cutting may be done either with shears or with a thin sharp cold chisel, or, preferably, with a hacksaw. Where possible, cutting, such as cutting to rake for gable ends, should be done at our works, where the edges are properly bound and sealed. If the protective coating is damaged in fixing use a little of the mastic to seal the broken edges.

In punching holes a very sharp punch should be used and a wood or lead block shaped to fit into the corrugation should be placed under the sheet at the spot to be punched. The most effective punch is one tapered from a point to  $\frac{3}{8}$ " diameter in a length of 3".

The maximum spacings of purlins recommended for roofs of 30° pitch or over are as follows:—

|                     |    |    |    |    |    |    |                |
|---------------------|----|----|----|----|----|----|----------------|
| For 26 gauge sheets | .. | .. | .. | .. | .. | .. | 4' 3" centres. |
| „ 24 „ „            | .. | .. | .. | .. | .. | .. | 5' 6" „        |
| „ 22 „ „            | .. | .. | .. | .. | .. | .. | 6' 6" „        |
| „ 20 „ „            | .. | .. | .. | .. | .. | .. | 7' 3" „        |

but for curved roofs or for side runners these spacings may be increased with safety.

Sheets can be curved to any radius down to a minimum of 12 inches.

Sheet lights can be supplied if required, either dead lights or opening lights; the standard light being 3 ft. x 1 ft. 6 ins.

The weights of "FERRO-ROK" are as follows:—

|          |    |    |    |    |    |    |                            |
|----------|----|----|----|----|----|----|----------------------------|
| 26 gauge | .. | .. | .. | .. | .. | .. | 1'40 lbs. per square foot. |
| 24 „     | .. | .. | .. | .. | .. | .. | 1'60 lbs. „ „ „            |
| 22 „     | .. | .. | .. | .. | .. | .. | 1'87 lbs. „ „ „            |
| 20 „     | .. | .. | .. | .. | .. | .. | 2'10 lbs. „ „ „            |

We are prepared to quote for the complete roof covered with "Ferro-Rok" or for supplying and fixing only on framework left ready by the general Contractor.



## "FLEX TILE" SHINGLES

IT is always a problem how to economise on the construction of a sloping roof without at the same time sacrificing both efficiency and artistic appearance.

The introduction of "Flex tile" Shingles has solved the difficulty.

Asphalt as used for roofing is well known for its durability. It is absolutely impervious to water and is an effective barrier to the passage of heat and cold. A roof should be as nearly proof against fire and the elements as possible. A roof should be beautiful with a beauty that endures. Low cost is desirable and there should be no cost for repairs.

"Flex tile" Shingles are permanent, fire-resisting, and, when laid, give the same effective appearance as slates or tiles.

"Flex tile" Shingles are made from an exceptionally high quality asphalt roofing covered with a layer of slate chippings on the exposed surface. The roofing is cut in strips 36" x 10" and these strips are further subdivided into four by a slot or cut-out 4" deep. The strips are laid with four inches exposed to the weather, giving a 6" overlap and 2" cover as in tiling. The appearance of the finished job is the same as given by a 9" wide slate or tile.

The cut-outs throw sufficient shadow to give the finished roof an appearance of solidity and at the same time break up the surface into attractive lines. "Flex tile" Shingles are made in two colours—Rust Red and Grey-Green. The colours are natural and no alteration takes place beyond such slight changes as are due to the usual weathering of the slate.

"Flex tile" Shingles will thus harmonize with any surroundings and give an attractive appearance to any building.

The use of "Flex tile" Shingles effects considerable saving in cost. Not only are the shingles themselves lower in price than slates or tiles but some economy can be effected in the supporting structure. The weight of the shingles is only 200 lbs. per square as compared with 840/1000 lbs. for slates or 890/1680 lbs. for tiles, and roofs can therefore be designed for lighter loads.

There is a saving in handling owing to the light weight. "Flex tile" Shingles are easily and quickly laid.



There is no loss from breakages either in transit or in cutting for angles and corners.

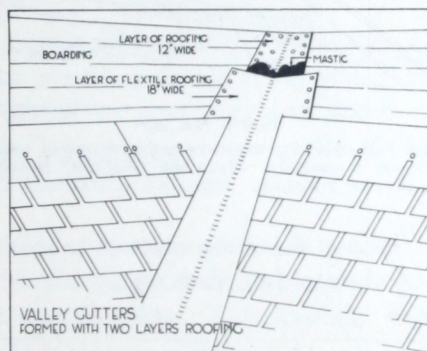
Odd shaped roofs can be covered without loss. The shingles can be cut with a knife to any desired shape for dormers, curved soffits, valleys, etc.

### INSTRUCTIONS FOR LAYING "FLEXITILE" SHINGLES.

The entire roof should be covered with well seasoned sheeting boards of uniform thickness laid close together. T. & G. sheeting makes the best job.

**VALLEYS AND GUTTERS.** As in all roof work valleys and gutters should be constructed first. These may be of lead or copper, but if desired can be formed with two layers of "Flextile" Roofing. "Flextile" Roofing is supplied for the purpose in any width required, but we recommend the understrip to be 12" wide and the upper strip 18" wide, thus bringing the edge well under the shingles (see Sketch 1).

The under layer is nailed to the boarding, the upper layer being cemented to this with Hard Rok Mastic applied hot. Nail the upper layer at the edges only as shown, thus leaving no nail heads exposed when the roof is completed.

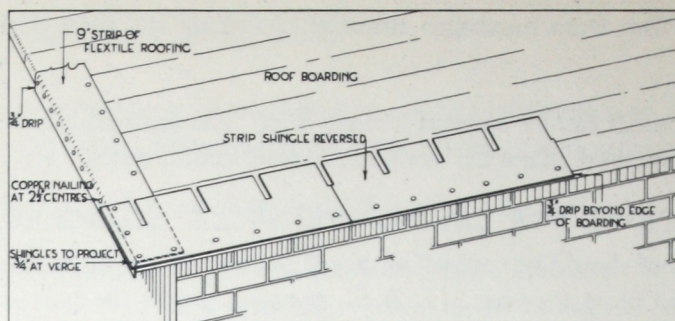


**Sketch No. 1**  
Showing double protection of "Flextile" Roofing strips in valley.

A strip of "Flextile" Roofing 9" wide is next fixed at the verges as shown in Sketches 2 and 2a.

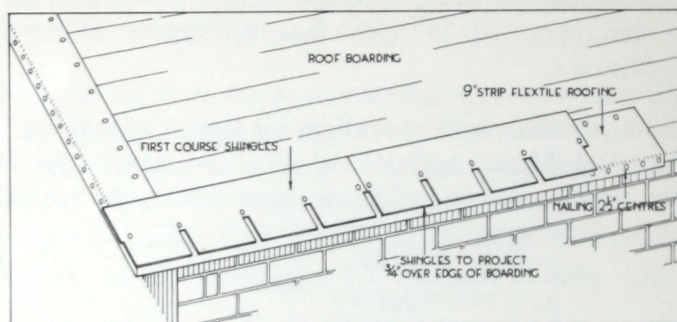
The Starting or Eaves course should be a row of Shingles reversed, i.e., with the slots pointing up the roof—see Sketch 2—or alternatively a strip of "Flextile" Roofing not less than 9" wide but preferably 18" wide (see Sketch 2a) may be used.





Sketch No. 2

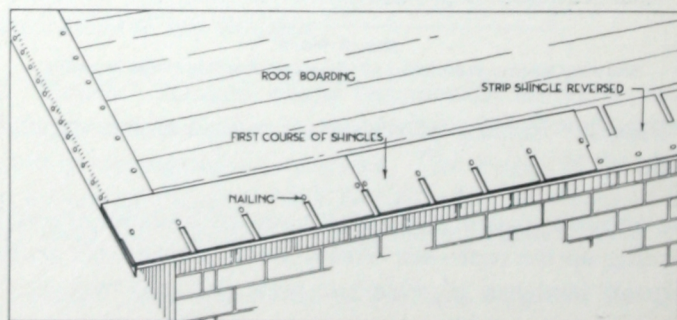
Showing 9" strip of "Flextile" Roofing at verge and starting or eaves course of Shingles reversed. Note correct position of nails. This course is commenced by cutting off half of the first leaf to ensure breaking joint when the first course proper is laid.



Sketch No. 2a

Showing strip of "Flextile" Roofing as starting or eaves course with first course of Shingles in position. Note the "Flextile" Roofing bent over and nailed to edge of boarding.

The Shingles are now fixed in the same manner as in slating, commencing at the eaves and working up the roof (see Sketch 3).

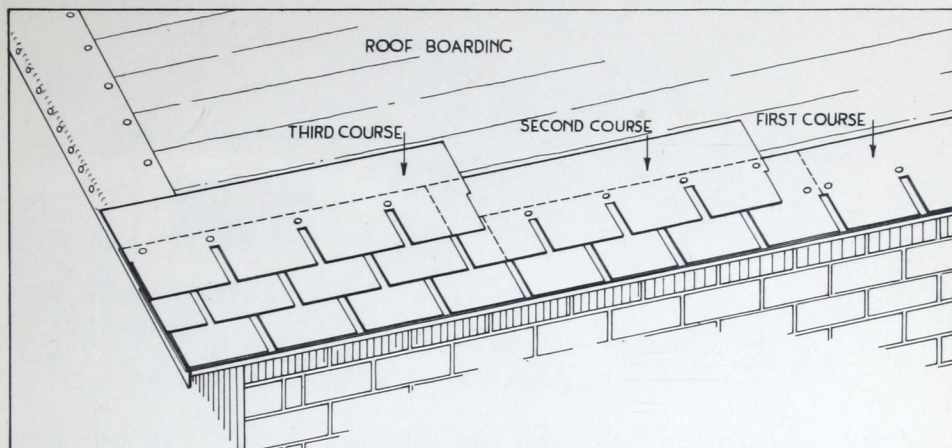


Sketch No. 3

Showing first row of Shingles in position.



Each alternate row is commenced by cutting off half of the first leaf so as to bring the joints in each row midway between those in the next (see Sketch 4).



Sketch No. 4  
Showing second and third courses in position.

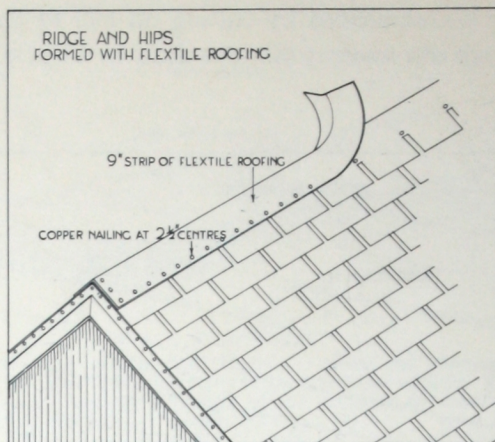
The first course proper should overhang the edge of the roof boarding by about  $\frac{3}{4}$ ", and a similar overhang should be allowed at the verges. The strip of "Flextile" Roofing should be bent over and nailed to ends of boarding as shown in the sketches. If barge boards are used the Shingles should be finished flush with the edge of the barge boards.

**OVERLAP.** The width of the shingle is 10" and the depth of the slot 4". When laying, place the Shingle so that the bottom edge comes in line with the top of the slot in the shingle below. This leaves 4" exposed to the weather in each course.

**NAILING.** Use the 1" galvanized clout nails supplied with the shingles. Nail each course  $\frac{1}{2}$ " above each slot as shown in the illustration. At projecting edges where there is likely to be wind pressure some additional nailing should be put in. Care must be taken not to drive nails between the joints of boarding.

**RIDGES AND HIPS.** Use "Flextile" Roofing Strips 9" wide and bend over the ridge or hip, laying  $4\frac{1}{2}$ " on each side. Fasten with nails along edge at 2" centres and  $\frac{3}{4}$ " from edge (see Sketch 5).

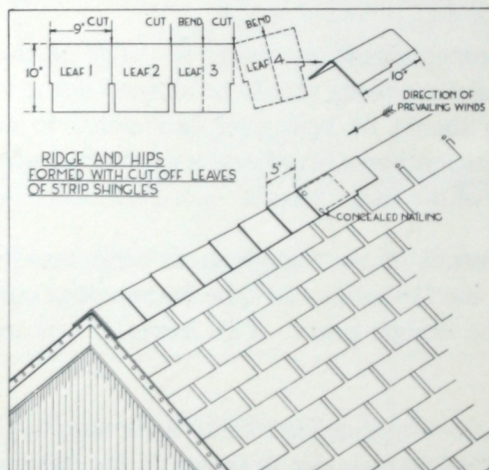




Sketch No. 5

Showing Roof being closed in and completed with a strip of "Flextile" Roofing at the ridge.

Alternatively, cut the shingle strips into individual pieces  $9" \times 10"$  and bend over the ridge or hip, overlapping to expose 5" to the weather and nailing as shown in Sketch 6.



Sketch No. 6

Showing method of cutting strip in pieces and fixing over the ridge.

FLASHINGS. Are carried out in the usual method employed in slating. Upstands may be "Flextile" Roofing strips but counter flashings should be carried out in metal.





*Residence at Rednal, Birmingham. 900 feet above sea level*



*Scout Clubroom, The County High School for Boys, Altrincham, Cheshire*

TYPICAL BUILDINGS COVERED WITH ANDERSONS "FLEXITILE" SHINGLES



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